

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:  
**NORBERT A. FELISS, ET AL.**

Serial No.: 09/804,105

Filed: 12 MARCH 2001

For: **HEAD SHOCK RESISTANCE AND  
HEAD LOAD/UNLOAD PROTECTION  
FOR REDUCING DISK ERRORS AND  
DEFECTS, AND ENHANCING DATA  
INTEGRITY OF DISK DRIVES**

Docket No. SJO920000138US1

Examiner: MINH LE

Art Unit: 2652

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APPEAL BRIEF

Honorable Commissioner of Patents  
Washington, D.C. 20231

Sir:

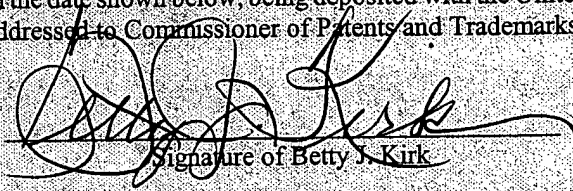
This Brief is submitted in triplicate in support of the Notice of Appeal, filed on April 3, 2003,  
in the above-referenced application.

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### **REAL PARTY IN INTEREST**

The Real Party in Interest in the present Appeal is International Business Machines Corporation, the assignee, as evidenced by the assignment set forth at Reel 011686, Frame 0273.

### **RELATED APPEALS AND INTERFERENCES**

No related appeals or interferences are known to Appellant, Appellant's legal representative, or assignee which will directly affect, or be directly affected by, or have a bearing on the Board's decision in the present Appeal.

### **STATUS OF THE CLAIMS**

Claims 1-4, 7-10, and 12-15 stand finally rejected by the Examiner as noted in the Final Office Action dated February 3, 2003. However, only claims 1-4, 7, 8, 12, and 13 are on appeal. See, "Status of the Amendments."

### **STATUS OF THE AMENDMENTS**

An Amendment was submitted subsequent to the Final Office Action pursuant to 37 C.F.R. § 1.116, in which claims 9, 10, 14, and 15 were canceled. Hence, only claims 1-4, 7, 8, 12, and 13 are on appeal.

## **SUMMARY OF THE INVENTION**

As shown in Figures 1-4, Appellant's invention comprises a disk drive slider having a layer of mechanical shock protection that is provided by means of an overcoat layer. Page 7, lines 19-22. The overcoat layer is applied only on the areas of the slider that are prone to contact a read/write disk of the drive when the head is loaded off the platform, or when the head is shocked while in operation over the data zone of the disk. Page 8, line 26, through page 9, line 13. The top surface of the slider is completely encased in the overcoat material, other than the tips of the protrusions. Page 9, lines 20-21. The material used to form the layer absorbs shock and reduces wear, and is bonded or sputtered to the slider in a region other than the air bearing surfaces. Page 7, lines 23-26. This region is typically the reactive-ion etched surface area and is slightly recessed below the air bearing surface of the slider. Page 4, lines 8-10. In one version of the invention, the slider is protected by covering only the corners (Figure 2) of lateral side edges of the slider with a suitable material. Page 7, lines 19-27.

## **ISSUE**

Is the Examiner's rejection of the claims under 35 U.S.C. § 103(a) as being unpatentable over the cited references well founded?

## **GROUPING OF THE CLAIMS**

For purposes of this appeal, claims 1-4 and 7 stand or fall together as a first group, and claims 8, 12, and 13 stand or fall together as a second group.

## ARGUMENTS

The Examiner finally rejected all of the claims under 35 U.S.C. § 103(a). The Examiner stated that claims 1-4 and 7 are unpatentable over *Hipwell* in view of *Comstock*, and that claims 8, 12, and 13 are unpatentable over *Hipwell* in view of *Boutaghou*. Final Office Action, paragraphs 4 and 5.

### The *Hipwell* reference

The cited prior art reference *Hipwell* discloses a slider 120 (Figure 4) with a perimeter rim cap 122. The rim cap completely covers and protrudes from the entire perimeter including all outer edges (front, rear, and sides) of the slider. As shown in Figure 5, the rounded surface interface 130 of the rim cap "is blended between a base 132 of the rim cap 122 at the slider body 80, and an upper surface 134 of the rim cap 122." Column 3, lines 36-37. In addition, "a smooth outer layer 140 [Figure 8] can be applied to rounded interface surface 130." As noted by the Examiner, *Hipwell* "does not expressly disclose a slider wherein a coating is located on the entire top surface of the supporting structure other than the air bearing surfaces of the protrusions, such that the air bearing surfaces are completely free of the coating." Final Office Action, page 2, paragraph 4.

### The *Comstock* reference

The cited prior art reference *Comstock* discloses an electrostatic discharge coating 20, 40 (Figures 3a, 3b, and 3c) that covers the entire slider/head assembly, other than the transducer 19 itself. In Figure 3a, only a small portion of the coating (having dimensions A and B) is removed

from the head. Col. 4, lines 42-44. In Figures 3b and 3c, the coating very precisely tapers down to the transducer itself. Col. 4, lines 47 and 54-56. Thus, in all three cases, the entire assembly 13 (Figure 5) including ABS 32 is coated with the coating, except for a portion of the trailing edge of the assembly at transducer 19. Col. 4, lines 27-29. Because of this critical requirement, *Comstock* clearly teaches away from the primary reference, *Hipwell*, which teaches a coating only on its rim cap 122. Thus, these two references are incompatible and cannot be joined together in light of their respective teachings.

Finally, the Examiner has contradictory arguments in the Final Office Action. On page 3, line 1, the Examiner states, "Comstock shows in Fig.2 a slider wherein a coating 20 is located on the entire top surface of the supporting structure." However, on page 9, paragraph 7, line 9, the Examiner states, "the tapered coating in the load-bearing surface allow head transducer contact with recording surface." Appellant respectfully maintains that only the latter statement is true.

#### **Claims 1-4 and 7**

Since *Hipwell* and *Comstock* cannot be combined, the claims of the present invention cannot be deemed obvious with respect to them. Moreover, the claims clearly distinguish the cited references. For example, claim 1 requires "a coating on the entire top surface of the supporting structure other than the air bearing surfaces of the protrusions, such that the air bearing surfaces are completely free of the coating." *Comstock's* side profile views of Figures 3a, 3b, and 3c clearly indicate that the entire assembly 13, including the air bearing surfaces 32 of rails 34 (Figure 5), are completely covered by the coatings 20, 40. The only portion of *Comstock's* assembly that is not

covered is the tip at the trailing edge which includes the transducer 19. Since *Hipwell* teaches a coating only on its rim cap 122, it is not compatible with *Comstock's* teaching to coat the entire slider other than the transducer at the trailing edge. Claim 1 requires the coating on the entire top surface of the supporting structure "other than the air bearing surfaces of the protrusions," and, "the air bearing surfaces [to be] completely free of the coating." Thus, claim 1 is not obvious in light of *Hipwell* and *Comstock*.

Moreover, since the goal of *Comstock's* coating is to discharge static electricity to protect the electrically-sensitive transducer, one skilled in the art would not be inclined to reduce the coating on other portions of the assembly. Rather, one skilled in the art would use the electrical coating wherever "possible electromagnetic shielding effects" or a reduction in "magnetic coupling" would be negligible or at least not affect the performance of the transducer. Col. 4, lines 15-20. For these reasons, claim 1 is not obvious in light of *Comstock* and is now in condition for allowance.

Claims 2-4 and 7 depend from claim 1 and are allowable for the same reasons as claim 1 in addition to their further distinguishing characteristics. For example, claim 2 now requires "the coating is located on and completely encases the entire pocket of the top surface of the supporting structure." It is not possible for *Comstock* to encase its entire pocket since a portion of its coating *must* be removed from that portion of the pocket adjacent to its transducer. Moreover, *Hipwells's* coating is limited to its rim cap 122. Claim 3 adds structural definitions and then states that "the coating is located on each of the corners of the top surface of the supporting structure." Each of Figures 3a, 3b, and 3c of *Comstock* clearly indicate that the trailing edge corners are not coated. Claim 4 requires the coating to be "located along and completely coats an entire length of the lateral

edges of the top surface of the supporting structure." Finally, claim 7 redefines the material of the coating as any "metals, carbon, doped carbon, and polymers" (supported on page 8, lines 5-11), whereas *Comstock's* coating is limited to just metals. Col. 5, lines 47-48. It is *Comstock's* slider/head assembly that is made of ceramic or polymer plastic (col. 3, lines 44-46), but there is no mention of carbon or doped carbon.

Furthermore, claims 3 and 4 state that it is the top surface of the supporting structure," not some other element that is coated. *Hipwell's* coating is strictly limited to its rim cap, not its top surface. Based on the teachings of *Comstock*, it is entirely inconsistent and counterintuitive to combine the features of *Hipwell* with this reference. Thus, claims 1-4 and 7 are in condition for allowance.

### **Claims 8, 12, and 13**

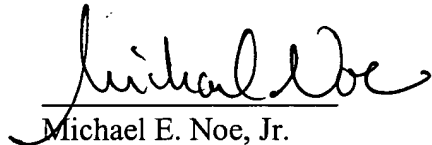
Both independent claims 8 and 13 draw upon many of the same features of the preceding claims. However, each of these claims require the shock-absorbing protrusions to be "located at a respective one of the corners of the *top surface* of the supporting structure" (emphasis added). In contrast, *Hipwell's* coating is located on top of its rim cap, not on its top surface. The third cited reference *Boutagou* merely stands for the proposition that the height of shock-absorbing protrusions may differ from air bearing protrusions, and that they are discontinuous and formed from a softer material. However, the Examiner does not make it clear how one skilled in the art would be taught to remove the rim cap of *Hipwell* in order to accommodate the structural limitations of *Boutagou*.

As with the preceding claims, Appellant is unpersuaded that these two references are compatible. In light of the foregoing arguments, claims 8, 12, and 13 are in condition for allowance.

Since the Examiner has provided no suggestion or teaching for one skilled in the art to modify any combination of these references to remove either of these detrimental elements. For these reasons, it is respectfully urged that the claims are in condition for allowance and favorable action is requested.

Please charge **Hitachi Global Storage Technologies Deposit Account No. 50-2587** in the amount of **\$320.00** for the Appeal Brief fee. If any additional fees are required, please charge **Hitachi Global Storage Technologies Deposit Account No. 50-2587**.

Respectfully submitted,



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ATTORNEY FOR APPLICANTS



## **APPENDIX**

1        1.        A slider for a disk drive, comprising:

2                a supporting structure having a top surface including a pocket and a plurality of protrusions  
3 protruding from the pocket, each of the protrusions having a protruding end that defines an air  
4 bearing surface; and

5                a coating on the entire top surface of the supporting structure other than the air bearing  
6 surfaces of the protrusions, such that the air bearing surfaces are completely free of the coating; and  
7 wherein

8                the coating is formed from a material that is softer than the supporting structure.

1        2.        The slider of claim 1 wherein the coating is located on and completely encases the entire  
2 pocket of the top surface of the supporting structure.

1        3.        The slider of claim 1 wherein the top surface of the supporting structure has a leading edge,  
2 lateral edges, a trailing edge, and a plurality of corners located at intersections of the leading edge,  
3 the lateral edges, and the trailing edge, (and the coating is located on each of the corners of the top  
4 surface of the supporting structure.)

1        4.        The slider of claim 1 wherein the top surface of the supporting structure has a leading edge,  
2 a trailing edge, and lateral edges extending therebetween, and the coating is located along and  
3 (completely coats an entire length of the lateral edges of the top surface of the supporting structure.)

1        7.        The slider of claim 1 wherein the material of the coating is selected from the group consisting  
2 of metals, carbon, doped carbon, and polymers.

1 8. A slider for supporting a transducer for use in a disk drive, comprising:  
2 a supporting structure having a top surface including a pocket, a leading edge, a trailing edge,  
3 lateral edges extending between the leading and trailing edges, corners located at intersections  
4 between the leading edge, the lateral edges, and the trailing edge;  
5 a plurality of air bearing protrusions protruding from the pocket;  
6 at least one shock-absorbing protrusion protruding from the pocket and having a height with  
7 respect to the pocket that differs from a height of the plurality of air bearing protrusions, such that  
8 the at least one shock-absorbing protrusion is discontinuous with the plurality of air bearing  
9 protrusions; wherein  
10 each of the air bearing protrusions and the at least one shock-absorbing protrusion has a  
11 protruding end that defines an air bearing surface, and the at least one shock-absorbing protrusion  
12 comprises a material that is softer than the supporting structure; and wherein  
13 the at least one shock-absorbing protrusion comprises a plurality of shock-absorbing  
14 protrusions, each of which is located at a respective one of the corners of the top surface of the  
15 supporting structure. *Fig 2 or Fig 3*

1 12. The slider of claim 8 wherein the shock-absorbing protrusion comprises a material selected  
2 from the group consisting of metals, carbon, doped carbon, and polymers.

1 13. A magnetic recording device for reading or writing magnetically, comprising in combination:  
2 a disk comprising a substrate and a metallic magnetic layer;  
3 a head support on a slider for magnetically reading data to or writing data from the magnetic  
4 layer on the disk, the slider comprising a supporting structure having a top surface with a pocket, the  
5 top surface of the supporting structure having a leading edge, a trailing edge, lateral edges extending  
6 between the leading and trailing edges, and a plurality of corners located at intersections of the  
7 leading edge, the lateral edges, and the trailing edge;  
8 a plurality of air bearing protrusions protruding from the pocket, each of the air bearing  
9 protrusions having a protruding end that defines an air bearing surface, wherein at least some of the

10 air bearing protrusions are shock-absorbing protrusions, each having a height relative to the pocket  
11 that differs from a height of other ones of the air bearing protrusions, such that the shock-absorbing  
12 protrusions are discontinuous with said other ones of the air bearing protrusions, and at least the air  
13 bearing surfaces of the shock-absorbing protrusions comprise a material that is softer than the  
14 supporting structure;

15 a motor operable to rotate the disk;

16 an actuator connected to the slider for moving a head across the disk; and wherein

17 each of the shock-absorbing protrusions is located at a respective one of the corners of the  
18 top surface of the supporting structure. *fig 2 or fig 3*